DOCUMENT RESUME

ED 138 480 SE 022 521

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TITLE Results of Spring 1976 Survey of Engineering Freshmen.
PUB DATE [77]
NOTE 16p.; For related document, see ED 127 248; Contains occasional light and broken type

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Attitudes; *Educational Research; *Engineering; *Engineering Education; Higher Education; *Student Attitudes; *Student Characteristics; *Surveys

ABSTRACT

This survey is the second of a series of five surveys seeking to determine the characteristics and attitudes of male and female engineering students and the changes in these areas as students proceed through their first two years in engineering programs. Fifteen of the original 16 study schools included in the first survey were included in this survey. A questionnaire of 60 items was administered to a sample of students; 983 instruments were returned. Data are presented for the 60 items. These include such questions as reason for career choice, preferred work situation, source of personal satisfaction, problems, grades, reactions to instructors, reactions to friends, reactions to various academic work, and future plans. (RH)

RESULTS OF SPRING 1976 SURVEY OF ENGINEERING FRESHMEN

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Introduction

The spring 1976 survey of engineering freshmen is the second of a series of five surveys seeking to determine the characteristics and attitudes of male and female engineering students, and the changes in these areas as students proceed through their first two years in engineering programs. The results of the first survey were presented in "Results of Fall 1975 Survey of Engineering Freshmen." (ED 127248)

Survey Population and Sample

The survey results refer to the population of all first-time engineering freshmen who entered one of forty-two schools during the fall 1975 term and continued in engineering at the same school during the spring 1976 term. We estimate that there were 17,739 students in this population, including 15,211 men and 2,528 women.

Fifteen of the original sixteen schools included in the fall 1975 survey sample participated in the spring 1976 survey. One of the eight randomly selected schools (the University of Tennessee at Knoxville) did not participate in the spring. In order to adjust for this non-participation, the responses of students in the other seven randomly selected schools (non-certainty schools) were subjected to additional weighting procedures. For these seven schools, men's weights were multiplied by a factor of 1.15, and women's by a factor of 1.10. These weight factors were based on the size of the male and female freshman engineering enrollments of the University of Tennessee for fall 1975 relative to the enrollments of the other seven randomly selected schools.

The Questionnaire

The questionnaire administered in the spring of 1976 consisted of 60 items designed by the research team. A number of the questionnaire items were adapted from Part I of the College Student Questionnaires, with the permission of the Educational Testing Service. The questionnaire took less than 30 minutes to complete.

Questionnaires were administered during the second half of spring term at the fifteen schools. Two different response rates have been calculated: (1) the overall response rate for the 15 participating schools and (2) the percentages of fall respondents who completed the spring survey.

The number of students in the original sample at the 15 institutions who continued in engineering in the spring of 1976 was 2,462, including 1,383 men and 1,079 women. Four hundred ninety-six men and 487 women completed the survey. Thus the overall response rates for the 15 schools in the spring 1976 survey were 35.9% for the men and 45.1% for the women.

Of course, only those students who had completed the fall 1975 survey were eligible for the spring survey. At the fifteen schools, 839 men and 704 women who had taken the fall survey remained in engineering in the spring. Thus 496/839 men (59.1%) and 487/704 women (69.2%) of those eligible at the fifteen schools completed the spring survey.

The presence of both school and student nonresponse creates some nonresponse bias of unknown magnitude. Nonresponse adjustment procedures are included in the analysis of the survey data in an attempt to minimize this nonresponse bias.

Analysis

Data were analyzed in terms of estimates of the proportions of men and of women in the population who would have a given response to a question. In order to make valid estimates of the population proportions, the data were subjected to statistical weighting procedures. Each "certainty school" respondent was assigned a weight having two components. The first component adjusts the sample to represent all students in the population. The second component is an adjustment for student nonresponse. Each "non-certainty school" respondent was assigned a weight having three components, i.e., the two just mentioned and the component to adjust for the non-participation of the University of Tennessee.

The precision of the estimated proportions was gauged by obtaining estimates of the standard errors of these estimated proportions. The standard error of an estimated proportion is a measure of the variability that the estimated proportion would have in repeated samples of the same type from this population. Typical estimated standard errors of estimated proportions for this survey range from .01 to .05. We also estimated the precision of the difference between the estimated proportions for men and for women. Typical estimated standard errors of differences in estimated proportions between men and women range from .02 to .06. By comparing the difference in the estimated proportions of men and women giving a certain response with the estimated standard error of the difference, we determined whether the differences in estimated proportions were statistically significant.

Results

Each survey question was tested for statistical significance of the difference in the estimated proportions of men and women giving a particular response or responses to the question. We used two levels of statistical significance, the .05 level and the .01 level. A difference that was significant at the .05 level means that there was only about one chance in twenty that the magnitude of the observed difference in estimated

proportions would be found if the population proportions were equal. Significance at the .01 level means that there was only about one chance in a hundred that the magnitude of the observed difference in estimated proportions would be found if the population proportions were equal. Survey results are given in the accompanying table. Responses in brackets were considered as one response in the statistical analysis.

Estimated Proportions of Students

Responding to Each Alternative in the Spring 1976 Survey+

Item and Response Description	Total	Men	Women	Significance of Difference
1. Engineering major field				
1. General	2.2	1.9	3.9	
2. Aeronautical and astronautical	1.6	1.6	1.4	
3. Chemical	16.6	16.5	17.4	
4. Civil	12.0	11.2	17.2	
5. Electrical	15.6	16.8	8.0	**
6. Industrial	2.3	2.1	3.9	
7. Mechanical	17.1	18.7	7.5	**
8. Mineral, petroleum and geological	6.1	6.1	6.1	
No response	26.5	25.1	34.6	
2. Engineering major field (continued)				
1. Agricultural	1.1	1.3	--	
2. Architectural	1.5	1.6	0.6	
3. Bioengineering	2.5	2.0	5.7	*
4. Ceramics	--	--	0.6	
5. Computer Science	3.0	2.8	4.5	
6. Engineering Physics	1.3	1.5	--	
7. Metallurgical	3.7	3.9	2.5	
8. Nuclear	2.7	2.8	1.8	
9. Other engineering	2.5	2.0	5.3	
10. Undecided, but in engineering	3.4	3.4	3.1	
No response	77.9	78.3	75.4	
3. Non-engineering major field				
1. Biological science	0.8	0.7	1.3	
2. Physical science	1.1	1.1	1.1	
3. Mathematics	0.7	0.7	1.1	
4. Social science, humanities, arts	--	--	0.9	
5. Education	--	--	--	
6. Business	0.8	--	3.0	
7. Agriculture	--	--	--	
8. Architecture or city planning	--	--	0.8	
9. Other non-engineering	0.9	0.8	1.8	
10. Undecided, not engineering	0.8	0.8	0.6	
No response	94.1	95.0	88.7	

+ Some survey questions were adapted from College Student Questionnaires-Part 1, with the permission of the Educational Testing Service

* indicates significant difference at the 5% level

** indicates significant difference at the 1% level

-- indicates percentages of less than 0.5

Item and Response Description	Total	Men	Women	Significance of Difference
4. Most important reason for career choice				
1. Job openings available	18.5	18.5	18.9	
2. Rapid career advancement	1.6	1.7	1.1	
3. High anticipated earnings	6.9	7.6	3.1	**
4. Contribution to society	6.6	6.5	7.4	
5. Work with ideas	8.2	8.9	4.0	**
6. Prestige of the profession	1.0	1.1	0.8	
7. Work with people	1.3	1.1	2.5	
8. Work itself is interesting	48.5	47.1	56.8	**
9. Opportunity to combine career & family	2.2	2.3	1.5	
10. Other	5.1	5.3	3.9	
No response	0.1	0.1	0.2	
5. Second reason for career choice				
1. Job openings available	25.2	24.6	28.8	
2. Rapid career advancement	4.0	4.0	3.5	
3. High anticipated earnings	21.9	23.2	14.1	**
4. Contribution to society	8.3	8.6	6.2	
5. Work with ideas	10.6	10.1	13.9	
6. Prestige of the profession	2.5	2.0	5.3	
7. Work with people	4.6	4.4	5.4	
8. Work itself is interesting	17.9	18.1	16.6	
9. Opportunity to combine career & family	3.0	2.7	4.8	
10. Other	1.6	1.7	1.1	
No response	0.5	0.5	0.3	
6. Third reason for career choice				
1. Job openings available	17.9	17.9	17.9	
2. Rapid career advancement	8.6	9.0	5.9	*
3. High anticipated earnings	20.4	20.0	22.7	
4. Contribution to society	8.9	8.7	10.1	
5. Work with ideas	9.8	10.5	5.6	**
6. Prestige of the profession	7.3	7.5	6.1	
7. Work with people	5.5	4.8	9.7	**
8. Work itself is interesting	10.5	11.0	8.1	
9. Opportunity to combine career & family	3.7	3.3	6.3	
10. Other	6.3	6.3	6.3	
No response	1.1	1.1	1.1	
7. Preferred professional work situation				
1. Own business	11.4	12.5	4.9	**
2. Small business firm	9.2	9.0	10.4	
3. Medium-large firm or corporation	39.8	40.5	35.9	
4. Own professional office	7.7	8.1	5.1	
5. Educational institution	2.4	2.2	3.7	
6. Public or private research organization	13.4	12.5	18.9	*
7. Public or private welfare agency	0.5	0.5	0.5	
8. Government service	1.9	1.6	4.1	
9. Other firm, organization or situation	1.4	1.1	3.2	
10. I don't know	12.0	11.8	13.1	
No response	0.3	0.3	0.0	

Item and Response Description	Total	Men	Women	Significance of Difference
8. Expected professional work situation				
1. Own business	2.4	2.8	0.2	*
2. Small business firm	4.0	4.0	3.8	
3. Medium-large firm or corporation	64.2	64.5	62.8	
4. Own professional office	2.7	2.9	1.2	
5. Educational institution	2.1	2.0	2.7	
6. Public or private research organization	3.5	3.1	6.2	**
7. Public or private welfare agency	1.0	1.1	--	
8. Government service	2.9	2.6	4.2	
9. Other firm, organization or situation	2.9	2.7	4.0	
10. I don't know	13.6	13.5	13.9	
No response	0.7	0.7	0.5	
9. Highest degree planned				
1. No degree	--	--	--	
2. Bachelor's degree	38.1	37.0	45.3	
3. Master's degree, not in business	33.5	34.4	28.2	**
4. M.B.A.	10.1	10.5	7.7	
5. Ph.D. or Ed.D.	10.1	10.1	9.9	
6. Law degree	2.2	2.1	2.8	
7. Medical degree	2.3	2.0	4.1	
8. Dental degree	--	--	--	
9. Other degree	0.9	0.9	0.9	
No response	2.3	2.5	0.9	
10. Greatest source of personal satisfaction in freshman year				
1. Coursework in general	13.9	13.5	16.4	
2. Coursework in major	10.3	10.7	8.4	
3. Individual study	2.2	2.4	1.3	
4. Organized extracurricular activities	5.8	6.3	3.2	**
5. "Bull sessions" with students	5.4	5.6	3.6	
6. Social life, dating, parties	7.5	7.6	7.1	
7. Close friendships with students	14.6	13.9	18.9	**
8. Wide variety of acquaintances	11.3	10.9	13.9	
9. Self-discovery, self-insight	27.1	27.5	24.6	
No response	1.7	1.6	2.7	
11. Second greatest source of personal satisfaction				
1. Coursework in general	15.8	16.2	13.1	
2. Coursework in major	10.7	11.0	8.7	
3. Individual study	6.0	6.7	1.9	**
4. Organized extracurricular activities	8.1	8.3	7.0	
5. "Bull sessions" with students	7.5	7.9	5.2	
6. Social life, dating, parties	7.3	7.1	8.6	
7. Close friendships with students	11.4	11.2	12.6	
8. Wide variety of acquaintances	16.4	15.7	20.8	*
9. Self-discovery, self-insight	13.6	12.7	18.8	**
No response	3.1	3.1	3.3	

Item and Response Description	Total	Men	Women	Significance of Difference
12. Biggest problem during freshman year				
1. No major problems	15.4	15.1	17.2	
2. Finances	7.7	8.1	5.2	
3. Medical problems	0.7	0.7	0.7	
4. Handling course content	34.2	33.8	37.1	
5. Relationships with members of opposite sex	8.6	9.3	4.8	*
6. Deciding on major	8.6	8.3	10.4	
7. Family relations	1.5	1.4	2.1	
8. Discriminatory practices	0.7	0.7	0.8	
9. "Finding" oneself	15.8	15.8	15.3	
10. Other	6.5	6.6	5.9	
No response	0.3	0.3	0.4	
13. Second problem during freshman year				
1. No major problems	16.4	16.3	17.1	
2. Finances	11.3	11.6	9.3	
3. Medical problems	0.9	0.8	1.4	
4. Handling course content	15.3	15.1	16.2	
5. Relationships with members of opposite sex	12.3	12.8	9.1	
6. Deciding on major	9.5	9.1	12.0	
7. Family relations	2.6	2.3	4.5	
8. Discriminatory practices	0.7	--	2.5	
9. "Finding" oneself	14.1	13.7	16.7	
10. Other	9.7	10.5	5.1	
No response	7.3	7.5	6.1	
14. Extent of participation in preprofessional organizations				
1. Not at all	74.3	77.0	57.7	**
2. To a small extent	21.8	19.3	36.6	**
3. Fairly extensively	3.1	2.7	5.4	
4. Very extensively	0.5	0.5	--	
No response	0.4	0.4	0.1	
15. Non-required reading				
1. Nonfiction in science, math, engineering	8.6	9.5	3.3	**
2. Science fiction	8.8	9.7	3.9	**
3. Mysteries, adventure fiction	4.2	4.2	4.0	
4. Social sciences	8.1	8.1	7.9	
5. Psychology	0.9	0.8	1.9	
6. Novels, short stories, drama, poetry, etc.	16.8	13.0	39.3	**
7. Biographies and autobiographies	--	--	0.6	
8. Nonfiction--sports, leisure, etc.	26.8	29.6	10.0	**
9. Other	9.2	9.6	7.1	
10. Little or none	16.4	15.5	22.0	**
No response	0.0	0.0	0.0	

Item and Response Description	Total	Men	Women	Significance of Difference
16. Relative amount of study as freshman				
1. Much less than most classmates	8.8	9.7	3.3	**
2. Slightly less than most others	20.8	21.4	17.4	**
3. Same as most others	32.3	31.1	39.2	
4. Slightly more than most others	29.4	29.4	28.9	
5. Much more than most others	7.9	7.5	10.4	
No response	0.8	0.8	0.8	
17. Approximate first term grade average				
1. D+ or lower	5.2	5.3	4.6	
2. C-	4.7	4.8	4.4	
3. C	9.2	9.7	6.5	
4. C+	13.4	13.3	14.1	
5. B-	9.4	9.5	8.8	
6. B	15.0	14.8	16.4	
7. B+	16.4	16.3	16.8	
8. A-	11.5	11.8	9.6	
9. A or A+	14.6	14.0	18.4	
No response	0.6	0.6	0.4	
18. Importance of good grades				
1. Not important	3.7	4.0	2.1	
2. Somewhat important	24.4	24.5	23.6	
3. Quite important	47.6	46.9	51.7	
4. Extremely important	24.3	24.6	22.0	
No response	0.1	0.0	0.7	
19. Academic performance in comparison with others of own sex				
1. Better than most	36.6	38.6	24.5	**
2. Equal performance	46.2	43.6	62.1	**
3. Worse than most others	16.6	17.4	12.2	**
No response	0.6	0.5	1.2	
20. Academic performance in comparison with those of opposite sex in engineering				
1. Better than most	36.7	39.0	23.0	**
2. Equal performance	45.3	43.4	56.6	**
3. Worse than most	16.8	16.4	18.8	
No response	1.2	1.2	1.6	
21. Most confident academic situation				
1. Group of same sex	7.4	7.5	7.0	
2. Group of opposite sex	3.4	2.6	8.7	**
3. Equally mixed group	7.5	6.7	13.0	**
4. Sex ratio makes no difference	80.1	81.7	71.0	**
No response	1.5	1.7	0.3	
22. Amount of competitiveness for grades				
1. A great deal	37.3	36.8	39.8	
2. A fair amount	42.6	43.4	37.9	
3. Only a little	16.6	16.2	19.3	
4. None	3.5	3.6	2.8	
No response	0.0	0.0	0.2	

Item and Response Description	Total	Men	Women	Significance of Difference
23. Anxiety during course exams				
1. Very anxious	35.4	34.7	40.1	*
2. Somewhat anxious	50.2	50.1	50.5	
3. Not anxious	14.3	15.2	9.0	**
No response	0.1	0.0	0.4	
24. Greatest influence during freshman year				
1. Male faculty/staff member	6.6	6.2	8.9	
2. Female faculty/staff member	1.0	0.8	2.1	
3. Male engineering students	19.5	19.7	18.4	
4. Female engineering students	4.4	3.4	9.9	**
5. Other male friends on campus	23.5	25.6	10.6	**
6. Other female friends on campus	6.2	4.4	17.1	**
7. Male friends from home town	2.9	2.9	3.2	
8. Female friends from home town	4.8	5.3	1.6	
9. Family member(s)	12.8	12.7	13.3	
10. Other	14.0	14.5	10.4	
No response	4.2	4.2	4.5	
25. Consults with parents on important personal decisions				
1. Almost always	18.5	16.4	31.0	**
2. Usually	36.0	36.2	35.2	
3. Occasionally	25.1	25.7	20.9	*
4. Rarely	20.0	21.2	12.8	**
No response	0.4	0.5	0.0	
26. Degree of dependence on parents				
1. Quite dependent	14.7	14.9	13.5	
2. Somewhat dependent	28.7	28.4	30.7	
3. Fairly independent	41.3	40.9	44.1	
4. Very independent	14.9	15.6	10.7	**
No response	0.3	0.2	1.0	
27. Personal relationship with instructors				
1. No	83.4	83.6	82.4	
2. One male instructor	8.1	8.0	8.7	
3. One female instructor	2.0	2.1	0.9	
4. One male and one female instructor	1.0	0.9	1.3	
5. Two male instructors	2.9	2.9	3.4	
6. Two female instructors	--	--	--	
7. More than two instructors	2.3	2.2	2.8	
No response	0.3	0.2	0.5	
28. Satisfaction with opportunity to individually discuss work with instructors				
1. Extremely dissatisfied	5.2	5.4	4.2	
2. Dissatisfied	23.6	24.1	20.4	
3. Satisfied	61.4	61.0	63.9	
4. Extremely satisfied	8.7	8.4	10.6	
No response	1.1	1.1	0.9	

Item and Response Description	Total	Men	Women	Significance of Difference
29. Consults with close friends on important decisions				
1. Almost always	16.1	13.4	32.2	**
2. Usually	43.4	43.3	43.7	
3. Seldom	28.3	29.8	19.4	**
4. Almost never	12.0	13.3	4.0	**
No response	0.2	0.1	0.6	
30. Feelings about sex ratio in engineering at ones college				
1. Too high a proportion of men	53.8	58.6	25.2	**
2. The proportions are fine	42.4	37.5	71.9	**
3. Too high a proportion of women	1.9	2.0	1.1	
No response	1.9	1.9	1.9	
31. Knows other engineering students in living unit				
1. Yes	86.2	85.3	91.3	**
2. No	3.7	3.5	4.8	
3. Inapplicable to living situation	10.1	11.1	3.9	**
No response	0.1	0.1	0.0	
32. Number of engineering students among three closest female friends				
1. None	54.7	57.4	38.9	**
2. One	26.1	24.6	35.1	**
3. Two	8.9	7.8	15.3	**
4. Three	7.5	6.9	10.7	
No response	2.8	3.2	0.1	
33. Number of engineering students among three closest male friends				
1. None	19.6	18.9	24.1	
2. One	29.7	31.1	21.9	**
3. Two	23.3	22.8	26.2	
4. Three	26.0	25.7	27.6	
No response	1.4	1.6	0.3	
34. Estimate of proportion of men among practicing engineers in US				
1. 95% or more	18.9	18.7	20.2	
2. 90-94%	29.0	29.0	29.1	
3. 85-89%	25.5	25.9	23.2	
4. 80-84%	11.1	11.5	8.7	
5. Less than 80%	2.9	2.7	4.1	
6. No idea	11.9	11.5	14.3	
No response	0.7	0.7	0.5	
35. Knew a married woman who was successful in personal and working life				
1. Yes	79.8	79.5	81.7	
2. No	19.3	19.6	17.7	
No response	0.8	0.9	0.6	

Item and Response Description	Total	Men	Women	Significance of Difference
36. Knew a single women who was successful in personal and working life				
1. Yes	68.6	67.5	75.6	*
2. No	30.6	31.8	23.5	
No response	0.7	0.7	0.9	
37. Acquainted with a male engineer before college				
1. Yes	74.1	74.2	73.8	
2. No	25.7	25.8	25.1	
No response	0.2	0.0	1.1	
38. Acquainted with a female engineer before college				
1. Yes	8.3	7.2	14.3	**
2. No	91.6	92.7	85.3	
No response	0.1	0.1	0.4	
39. Plans for Fall 1976 school term				
1. Return in engineering	85.9	86.1	84.7	
2. Return in science or math	2.2	2.1	2.8	
3. Return in other field	1.6	1.3	3.5	
4. Study engineering elsewhere	1.3	1.4	0.9	
5. Study science or math elsewhere	0.5	--	1.0	
6. Study other field elsewhere	0.5	--	0.7	
7. Work on co-op program	2.4	2.5	1.8	
8. Leave school completely	0.6	0.6	--	
9. Other	0.9	0.8	1.2	
10. Unknown	3.9	4.1	2.7	
No response	0.2	0.2	0.4	
40. Indicate major reason for leaving engineering				
1. Academic difficulty	3.0	3.1	2.5	
2. Financial reasons	0.8	0.7	1.0	
3. Image of the profession	0.9	1.0	--	
4. Interest in another field	4.3	3.9	6.3	
5. Lack of interest in engineering	2.6	2.6	2.6	
6. Personal reasons	1.0	1.0	0.8	
7. Engineering courses unappealing	1.1	0.8	2.9	
8. Other	1.3	1.4	0.7	
No response	85.2	85.5	83.2	
41. Age preference for marriage				
1. Inapplicable, or I don't know	16.6	17.7	9.9	**
2. Never	2.9	3.1	1.6	
3. 20 years old or younger	1.5	1.5	1.5	
4. 21 to 23	26.1	25.6	29.3	
5. 24 to 26	34.9	34.0	39.8	
6. 27 to 29	11.5	11.2	13.2	
7. 30 to 32	3.5	3.6	3.1	
8. 33 to 35	0.9	1.0	0.6	
9. 36 to 38	--	--	--	
10. 39 years old or older	--	--	--	
No response	1.2	1.3	0.7	

Item and Response Description	Total	Men	Women	Significance of Difference
42. Age preference for completing school				
1. Inapplicable, or I don't know	3.0	3.0	3.1	
2. Never	--	--	0.6	
3. 20 years old or younger	0.9	1.0	--	
4. 21 to 23	71.3	69.9	79.2	
5. 24 to 26	19.6	20.5	14.6	*
6. 27 to 29	3.3	3.7	0.7	*
7. 30 to 32	--	--	--	
8. 33 to 35	--	--	0.8	
9. 36 to 38	--	--	--	
10. 39 years old or older	0.5	0.6	--	
No response	0.6	0.6	0.4	
43. Age preference for having first child				
1. Inapplicable, or I don't know	26.2	27.5	18.7	*
2. Never	4.9	4.3	8.6	**
3. 20 years old or younger	--	0.5	--	
4. 21 to 23	2.2	2.4	1.5	
5. 24 to 26	23.3	22.8	26.4	
6. 27 to 29	26.8	25.9	32.4	
7. 30 to 32	9.9	10.1	8.6	
8. 33 to 35	3.0	3.1	2.2	
9. 36 to 38	--	--	--	
10. 39 years old or older	--	--	--	
No response	2.7	2.8	1.6	
44. Age preference for having last child				
1. Inapplicable, or I don't know	30.3	31.4	23.9	*
2. Never	3.6	3.4	4.4	
3. 20 years old or younger	--	0.5	--	
4. 21 to 23	--	--	0.5	
5. 24 to 26	3.0	3.0	3.1	
6. 27 to 29	11.5	11.3	12.6	
7. 30 to 32	20.9	20.3	24.3	
8. 33 to 35	16.3	15.4	21.8	**
9. 36 to 38	7.3	7.7	5.1	
10. 39 years old or older	3.1	3.4	1.2	
No response	3.3	3.3	3.1	
45. Age to first start full-time professional work				
1. Inapplicable, or I don't know	3.6	3.2	5.6	
2. Never	--	--	--	
3. 20 years old or younger	--	--	0.8	
4. 21 to 23	48.9	46.6	62.7	**
5. 24 to 26	34.1	35.9	23.6	**
6. 27 to 29	9.3	10.1	5.0	
7. 30 to 32	1.7	1.8	0.8	
8. 33 to 35	--	--	--	
9. 36 to 38	--	--	--	
10. 39 years old or older	0.5	0.5	--	
No response	1.5	1.6	1.1	

Item and Response Description	Total	Men	Women	Significance of Difference
46. Age to first start part-time professional work				
1. Inapplicable, or I don't know	24.0	23.4	27.8	
2. Never	9.0	9.8	4.5	
3. 20 years old or younger	27.3	28.4	20.6	*
4. 21 to 23	22.8	24.3	13.9	**
5. 24 to 26	5.2	4.7	8.1	**
6. 27 to 29	1.6	0.9	5.9	**
7. 30 to 32	1.0	--	6.0	**
8. 33 to 35	0.6	--	1.2	
9. 36 to 38	0.6	--	3.3	
10. 39 years old or older	1.6	1.5	2.1	
No response	6.3	6.3	6.5	
47. Age to first stop working for over six months				
1. Inapplicable, or I don't know	34.1	33.4	38.2	
2. Never	11.2	11.6	8.8	
3. 20 years old or younger	1.1	1.2	--	
4. 21 to 23	1.6	1.6	1.4	
5. 24 to 26	2.6	1.6	8.3	**
6. 27 to 29	5.1	2.9	18.3	**
7. 30 to 32	3.2	2.9	5.1	
8. 33 to 35	2.3	2.5	0.8	
9. 36 to 38	1.5	1.7	0.5	
10. 39 years old or older	29.8	32.5	13.7	**
No response	7.6	8.0	4.7	
48. Age to return to full-time work				
1. Inapplicable, or I don't know	21.9	22.0	20.8	
2. Never	5.4	5.7	3.6	
3. 20 years old or younger	--	--	--	
4. 21 to 23	6.4	6.5	5.5	
5. 24 to 26	6.0	6.3	4.4	
6. 27 to 29	2.6	2.5	3.1	
7. 30 to 32	3.0	2.5	6.2	
8. 33 to 35	2.3	1.4	7.7	**
9. 36 to 38	1.9	1.0	7.2	**
10. 39 years old or older	8.9	8.5	11.8	
No response	41.4	43.3	29.7	**
49. Colleges described engineering education realistically				
1. Strongly agree	5.7	5.2	9.0	
2. Agree	40.0	39.4	43.2	
3. Neutral; no opinion	27.8	28.8	22.1	
4. Disagree	20.1	20.1	20.2	
5. Strongly disagree	4.6	4.7	4.2	
No response	1.7	1.8	1.2	

Item and Response Description	Total	Men	Women	Significance of Difference
50. Understood nature of an engineering career				
1. Strongly agree	7.8	8.1	5.6	
2. Agree	33.4	34.3	28.0	**
3. Neutral; no opinion	18.9	18.9	13.5	
4. Disagree	32.2	30.5	42.0	
5. Strongly disagree	6.9	6.4	10.0	
No response	1.7	1.8	1.0	
51. Strongly motivated to be an engineer				
1. Strongly agree	19.3	18.6	23.7	
2. Agree	42.4	43.3	37.4	
3. Neutral; no opinion	21.8	21.9	21.1	
4. Disagree	10.3	10.4	9.8	
5. Strongly disagree	4.4	4.0	6.3	
No response	1.8	1.8	1.7	
52. Parents enthusiastic about student being in engineering				
1. Strongly agree	26.6	24.6	39.1	
2. Agree	48.0	49.5	39.4	
3. Neutral; no opinion	18.8	19.4	15.4	
4. Disagree	4.0	4.2	3.2	
5. Strongly disagree	--	--	1.1	
No response	2.3	2.4	1.8	
53. Some academic fields outside engineering strongly interest the student				
1. Strongly agree	29.1	27.9	36.0	*
2. Agree	39.0	38.6	41.0	
3. Neutral; no opinion	17.7	18.6	12.9	*
4. Disagree	9.3	9.6	7.2	
5. Strongly disagree	3.0	3.2	1.9	
No response	1.9	2.1	1.0	
54. Grades are honest reflection of student's ability				
1. Strongly agree	7.7	7.0	11.7	*
2. Agree	26.4	25.7	30.2	
3. Neutral; no opinion	12.4	12.6	11.1	
4. Disagree	32.9	33.0	32.4	
5. Strongly disagree	18.9	19.9	12.7	
No response	1.8	1.8	1.8	
55. Graduating as an engineer is worth the effort				
1. Strongly agree	32.1	32.0	32.6	
2. Agree	42.2	42.5	40.5	
3. Neutral; no opinion	17.6	17.3	19.6	
4. Disagree	4.3	4.2	4.7	
5. Strongly disagree	1.4	1.6	0.6	
No response	2.4	2.5	1.9	

Item and Response Description	Total	Men	Women	Significance of Difference
56. Engineering faculty's advising and counseling is helpful				
1. Strongly agree	13.1	13.2	12.3	
2. Agree	34.6	33.5	41.6	
3. Neutral; no opinion	34.5	35.4	29.3	
4. Disagree	11.0	11.2	9.4	
5. Strongly disagree	4.9	4.8	5.5	
No response	2.0	2.0	1.9	
57. Expect a master's degree in engineering				
1. Strongly agree	12.9	13.4	10.0	*
2. Agree	24.4	25.2	19.8	
3. Neutral; no opinion	26.5	26.4	26.7	
4. Disagree	24.1	23.6	27.5	
5. Strongly disagree	10.0	9.2	14.6	
No response	2.1	2.3	1.4	
58. More strongly motivated to be an engineer than a year ago				
1. Strongly agree	11.7	9.9	22.3	
2. Agree	41.6	42.6	35.8	
3. Neutral; no opinion	24.6	26.0	16.0	**
4. Disagree	14.3	14.1	15.6	
5. Strongly disagree	5.5	5.0	8.7	
No response	2.2	2.3	1.7	
59. Engineering is a good field to be in to help solve social problems				
1. Strongly agree	13.0	12.9	13.8	
2. Agree	35.7	36.1	33.4	
3. Neutral; no opinion	32.8	32.7	33.0	
4. Disagree	12.4	12.4	12.0	
5. Strongly disagree	3.8	3.6	4.6	
No response	2.4	2.3	3.2	
60. Shouldn't worry about harmful effects of technology because new inventions will solve the problems				
1. Strongly agree	2.2	2.1	2.9	
2. Agree	7.5	7.9	4.8	
3. Neutral; no opinion	17.4	17.5	16.7	
4. Disagree	29.1	29.2	27.9	
5. Strongly disagree	40.6	39.9	44.5	
No response	3.3	3.3	3.2	